

## Claims

1. Device for the detection of seat occupancy, comprising  
a sensing layer associated to a seating surface of a seat, said sensing layer  
having at least one electrical property varying in response to a pressure  
and/or deformation applied to said sensing layer,  
5 a plurality of electrodes, said electrodes being associated to said sensing  
layer at a periphery of a sensing area, and  
a control unit connected to said electrodes, said control unit comprising  
means for evaluating a pressure profile acting on said sensing layer by de-  
termining said at least one electrical property between pairs of electrodes  
10 selected from said plurality of electrodes.
2. Device according to claim 1, wherein said control unit comprises means for  
evaluating said pressure profile using a tomography imaging method.
3. Device according to any one of claims 1 to 2, wherein said at least one  
electrical property comprises the electrical impedance of said sensing layer.
- 15 4. Device according to any one of claims 1 to 3, wherein said at least one  
electrical property comprises the electrical resistance or conductance of  
said sensing layer.
5. Device according to any one of claims 1 to 4, wherein said sensing layer  
comprises a rubber material having an internal electrical impedance which  
20 varies in dependence with a deformation of the material.
6. Device according to any one of claims 1 to 5, wherein said sensing layer  
comprises a foam material having an internal electrical impedance which  
varies in dependence with a deformation of the material.
7. Device according to any one of claims 1 to 6, wherein said sensing layer  
25 comprises  
a first carrier foil having at least one surface covered with a resistance ma-  
terial  
a second carrier foil having at least one surface comprising a plurality of  
areas covered with a conductive material

said first and second carrier foil being arranged at a certain distance from each other by means of a spacer material such that said areas covered with conductive material of said second carrier foil face said coating of resistance material of said first carrier foil.

- 5 8. Device according to claim 7, wherein said resistance material is printed onto said at least one surface of said first carrier foil.
9. Device according to any one of claims 7 to 8, wherein said conductive material is printed in said areas onto said at least one surface of said second carrier foil.
- 10 10. Device according to any one of claims 7 to 9, wherein said spacer material comprises an adhesive, which is arranged in a plurality of localized areas between said first and second carrier foil.
11. Device according to any one of claims 7 to 10, wherein said spacer material comprises a printable adhesive, which is printed in a plurality of localized  
15 areas onto one of said carrier foils.
12. Method for the detection of seat occupancy, said method employing a sensing layer associated to a seating surface of a seat, said sensing layer having at least one electrical property varying in response to a pressure and/or deformation applied to said sensing layer, said method comprising  
20 the steps of:
  - a) determining said at least one electrical property of said sensing layer between pairs of different locations situated at a periphery of a sensing area, and
  - b) evaluating a pressure profile acting on said sensing layer based on the  
25 determined electrical property values.
13. Method according to claim 12, wherein said step of evaluating said pressure profile uses a tomography imaging method.